

Suspended

Trend Study 2-5-96

Study site name: Smithfield Dry Canyon.

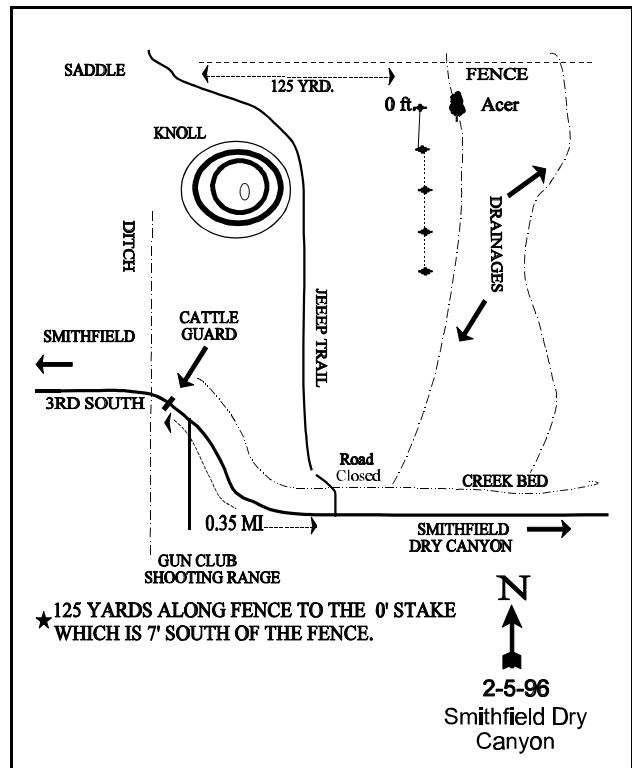
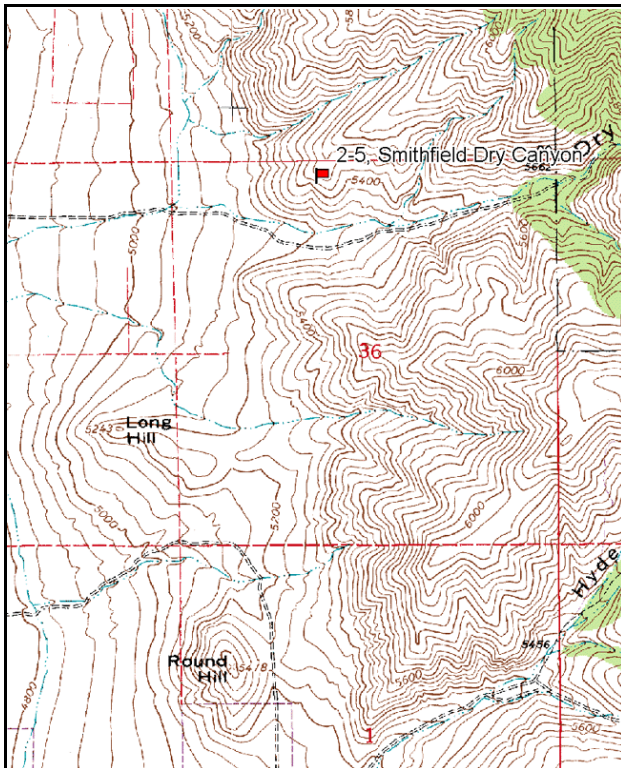
Vegetation type: Perennial Grass.

Compass bearing: frequency baseline 151 degrees magnetic

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

In Smithfield turn east (right) onto 3rd South and proceed up Smithfield Dry Canyon. The road eventually turns to gravel. Begin to note mileage at the cattle guard (old and filled in with dirt) outside of the canyon mouth. Proceed 0.35 miles up the canyon from the cattle guard to a point where a faint road takes off to the left, crosses the creek bed, and runs up the slope to the north. Four-wheel drive is advisable from this point. Proceed across creek and up the slope to the fence. Walk east along the fence approximately 125 yards and look for the 0-foot stake of the frequency baseline seven feet south of the fence. If one comes to a juniper by a drainage, backtrack 55 feet to the 0-foot stake. A red browse tag is wired to the 0-foot stake; #7952.



Map Name: Smithfield

Diagrammatic Sketch

Township 13N, Range 1E, Section 36

UTM 4631306 N, 434721 E

DISCUSSION

Trend Study No. 2-5

*****SUSPENDED** - This site was suspended in 2001 and will be reevaluated in 2006.

The Smithfield Dry Canyon study is located on the north side of Smithfield Canyon near an old bitterbrush "browse" transect. The study site is on a 35% south-facing slope at an elevation of 5,360 feet. Utilized as critical deer winter range, the area also is grazed by cattle during the summer. Once dominated by a good mix of antelope bitterbrush and mountain big sagebrush, the current community trend appears to be going toward annual grasses and forbs. Utilization of the remaining browse plants was extremely heavy in 1984, with many deer pellet groups and cattle pats present. During the 1996 reading, no pellet groups of any kind were encountered, but the site was utilized by a large number of grasshoppers.

The soil is relatively deep (>30") with very little rock on the surface or in the profile. The soil has a clay texture which resulted in large cracks 1 to 2 inches wide, reported in 1996, one day after a rain storm. The soil reaction is neutral (7.1 pH). Soil temperature was high however, with an average of nearly 72° F at a depth of 18 inches. Protective vegetation and litter cover are abundant and prohibit accelerated erosion.

Browse composition consists of a widely dispersed stand of antelope bitterbrush with some remnant mountain big sagebrush. Both species have been heavily browsed in the past, but currently display good vigor. Bitterbrush density was estimated at 300 plants/acre in 1996, 80% of which are mature. The decline in density from 799 plants/acre reported in 1990, to current levels is a result of the greatly increased sample used in 1996, which gives a much better estimate because of its widely dispersed nature. Only 60 dead plants/acre were estimated in 1996, indicating that no large die-off occurred since 1990. Utilization of the bitterbrush was considered moderate with heavy use reported on 33% of the population in 1996. Percent decadency declined from a high of 58% in 1990 to 13% by 1996. All plants displayed good vigor and many were producing seed. However, a long term decline in density is obvious. For example in 1984, nearly half of the bitterbrush plants with browse tags from the old browse transect were dead.

Mountain big sagebrush number only 40 plants/acre, all classified as mature. The population displays light use and good vigor, but no reproduction is evident. This is likely due to the abundant herbaceous understory which is dominated by annuals and weedy forbs.

In response to the decline in browse density and cover, there has been a concurrent increase in herbaceous density. The principal beneficiary prior to 1990 was Kentucky bluegrass, a naturalized turf grass. Kentucky bluegrass is a good quality forage species. However, it also is one that forms a dense sod that offers strong competition to developing shrub seedlings. With extended drought, Kentucky bluegrass has been replaced by bulbous bluegrass by 1990. Currently (1996), Kentucky bluegrass has essentially disappeared. The only common perennial grasses include bluebunch wheatgrass and bulbous bluegrass.

Forb composition is moderately diverse but includes few desirable species. The most uniformly distributed forb is arrowleaf balsamroot. Weedy forbs dominate the composition. These include curlycup gumweed, ragweed, aster, sunflower, tumble mustard, prickly lettuce, and yellow salsify. They currently account for 86% of the forb cover. Many forbs tend to occur in dense but irregularly distributed patches. Species such as pacific aster, ragweed, and mountain sage are also in this category.

1984 APPARENT TREND ASSESSMENT

For deer winter range, the overall trend must be judged as declining. Vegetative composition is becoming increasingly dominated by perennial grass and to a lesser extent, forbs. Valuable forage shrubs are rapidly disappearing. However, this same vegetative trend is resulting in a stable or even improving soil trend. Although some soil erosion is apparent, the increasing stand densities of Kentucky bluegrass appears to be stabilizing the site.

1990 TREND ASSESSMENT

This foothill slope retains remnants of bitterbrush and big sagebrush. The data indicates no substantial changes in density. Hedging appears light to moderate, compared to the heavy browsing noted in 1984. Vigor is fair. However, both populations are a little more than 50% decadent, an increase from 1984 when it was a little over 30%. There are few seedling and young shrubs because of the competition with the very dense weedy understory accompanied with extended drought. These weedy species also cause a high fire hazard, especially with the high numbers of annual brome grasses and bulbous bluegrass. Bluebunch wheatgrass has increased slightly since 1984. Bulbous bluegrass has greatly increased in nested and quadrat frequencies while Kentucky bluegrass has greatly reduced values. This would appear to be caused by the drought conditions we are now experiencing and that this is a marginal site for Kentucky bluegrass. Twelve of 19 forbs have increased, but many of them are weedy increasers. The soil is fairly well protected with percent bare ground decreasing.

TREND ASSESSMENT

soil - stable (3)

browse - stable but at very low densities (3)

herbaceous understory - downward trend because of increased prominence of weedy species (1)

1996 TREND ASSESSMENT

Soil trend is up due to a 50% increase in litter cover and a nearly 7-fold decline in percent bare ground. However, this improvement comes largely from an increase in annual grasses and their associated litter. Trend for the key browse species, bitterbrush, is up slightly. Density declined but most of the change is the result of the larger, more representative sample used in 1996 giving better estimates for populations that are widely dispersed and clumped. There are only 60 dead plants/acre of bitterbrush. Utilization is higher, but percent decadency has declined from 58% to 13% and vigor is good on all plants sampled. The herbaceous understory is shifting dramatically toward annual grasses and aggressive weedy forbs. Kentucky bluegrass was abundant in 1984 with a quadrat frequency of 97%. Quadrat frequency declined to 22% in 1990 and 0% in 1996. The only perennial grasses left are small quantities of bluebunch wheatgrass and bulbous bluegrass. Currently, annual brome grasses include rattlesnake brome, Japanese brome, and cheatgrass. They comprise 91% of the grass cover. These grasses were not included in the 1984 or 1990 samples, so no direct comparisons can be made. The forb component is dominated by low value aggressive forbs that mostly include ragweed, aster, curlycup gumweed, prickly lettuce, tumble mustard, and yellow salsify. Prickly lettuce and yellow salsify can provide some forage for big game. Since 1990, gumweed and prickly lettuce have increased significantly in nested frequency values and now represent the most abundant forbs on the site. Overall, sum of nested frequency for perennial grasses has declined over 4-fold, while sum of nested frequency for perennial forbs has increased slightly. Trend for the herbaceous understory is down.

TREND ASSESSMENT

soil - up (5)

browse - up slightly, but densities are still very low (4)

herbaceous understory - down (1)

HERBACEOUS TRENDS --

Herd unit 02 , Study no: 5

T y p e	Species	Nested Frequency			Quadrat Frequency			Average Cover %
		'84	'90	'96	'84	'90	'96	
G	Agropyron spicatum	44	57	33	16	18	13	1.29
G	Bromus brizaeformis (a)	-	-	6	-	-	2	.06
G	Bromus japonicus (a)	-	-	343	-	-	96	20.67
G	Bromus tectorum (a)	-	-	124	-	-	37	6.49
G	Poa bulbosa	_b 131	_c 340	_a 73	48	96	28	1.50
G	Poa pratensis	_c 309	_b 51	_a -	97	22	-	-
G	Poa secunda	-	9	-	-	4	-	-
Total for Annual Grasses		0	0	473	0	0	135	27.22
Total for Perennial Grasses		484	457	106	161	140	41	2.80
Total for Grasses		484	457	579	161	140	176	30.02
F	Achillea millefolium	5	7	-	2	3	-	-
F	Ambrosia psilostachya	_a -	_a -	_b 29	-	-	12	1.41
F	Artemisia ludoviciana	7	9	3	3	4	2	.16
F	Aster chilensis	_a 42	_b 109	_a 31	18	36	12	.53
F	Astragalus convallarius	-	4	4	-	1	1	.03
F	Balsamorhiza sagittata	_b 50	_b 48	_a 14	23	22	10	1.82
F	Calochortus nuttallii	3	4	-	1	3	-	-
F	Comandra pallida	3	8	6	1	4	2	.06
F	Cynoglossum officinale	-	2	-	-	1	-	-
F	Epilobium brachycarpum (a)	-	-	39	-	-	22	.51
F	Galium aparine (a)	-	-	5	-	-	2	.18
F	Grindelia squarrosa	_a 36	_a 28	_b 187	15	15	67	10.64
F	Hackelia patens	8	10	3	5	5	1	.03
F	Helianthus annuus (a)	15	33	18	7	18	9	.12
F	Helianthella uniflora	-	-	2	-	-	1	.00
F	Lappula occidentalis (a)	-	-	3	-	-	1	.00
F	Lactuca serriola	_a -	_b 99	_c 225	-	44	82	5.57
F	Lithospermum ruderae	8	11	12	4	6	7	.39
F	Navarretia intertexta (a)	-	-	6	-	-	4	.04
F	Phacelia spp.	7	-	-	3	-	-	-

T y p e	Species	Nested Frequency			Quadrat Frequency			Average Cover %
		'84	'90	'96	'84	'90	'96	'96
F	Phlox longifolia	_a 1	_b 88	_a 5	1	37	2	.03
F	Polygonum douglasii (a)	-	-	7	-	-	4	.02
F	Sisymbrium altissimum (a)	-	-	46	-	-	22	1.87
F	Solidago spp.	1	-	-	1	-	-	-
F	Tragopogon dubius	_a -	_c 130	_b 65	-	59	28	1.22
F	Viola spp.	_a -	_b 16	_a -	-	11	-	-
F	Zigadenus paniculatus	2	-	-	1	-	-	-
Total for Annual Forbs		15	33	124	7	18	64	2.76
Total for Perennial Forbs		173	573	586	78	251	227	21.94
Total for Forbs		188	606	710	85	269	291	24.71

Values with different subscript letters are significantly different at alpha = 0.10 (annuals excluded)

BROWSE TRENDS --

Herd unit 02 , Study no: 5

T y p e	Species	Strip Frequency	Average Cover %
		'96	'96
B	Artemisia tridentata vaseyana	2	.78
B	Purshia tridentata	14	3.07
Total for Browse		16	3.85

BASIC COVER --

Herd unit 02 , Study no: 5

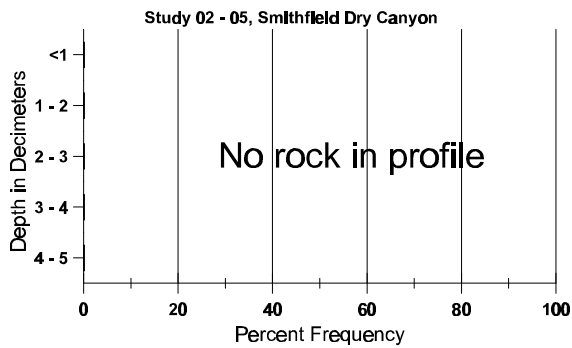
Cover Type	Nested Frequency	Average Cover %		
		'84	'90	'96
Vegetation	386	4.25	34.25	58.24
Rock	38	2.50	.25	.16
Pavement	17	.25	.25	.07
Litter	400	62.00	38.75	77.62
Cryptogams	-	0	0	0
Bare Ground	154	31.00	26.50	3.83

SOIL ANALYSIS DATA --

Herd Unit 02, Study no: 05, Smithfield Dry Canyon

Effective rooting depth (in)	Temp °F (depth)	PH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
27.5	71.6 (18.1)	7.1	24.3	28.4	47.4	3.3	17.0	284.8	.4

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 02 , Study no: 5

Type	Quadrat Frequency '96
Rabbit	1

BROWSE CHARACTERISTICS --

Herd unit 02 , Study no: 5

Field unit 02, Study no. 5																		
A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia tridentata vaseyana																		
Y	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	1	-	-	-	-	-	-	-	-	-	1	-	-	33			1
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	84	-	1	1	-	-	-	-	-	-	-	2	-	-	66	25	17	2
	90	1	-	-	-	-	-	-	-	-	-	1	-	-	33	24	17	1
	96	2	-	-	-	-	-	-	-	-	-	2	-	-	40	37	60	2
D	84	-	1	-	-	-	-	-	-	-	-	1	-	-	33			1
	90	1	-	-	1	-	-	-	-	-	-	1	-	-	66			2
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
X	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'84		67%			33%			00%			+25%							
'90		00%			00%			25%			-70%							
'96		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'84	99	Dec:	33%			
												'90	132		50%			
												'96	40		0%			
Gutierrezia sarothrae																		
M	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0	13	28	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'84		00%			00%			00%										
'90		00%			00%			00%										
'96		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'84	0	Dec:	-			
												'90	0		-			
												'96	0		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Purshia tridentata																		
Y	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	1	-	-	-	-	-	-	-	-	-	1	-	-	33		1	
	96	1	-	-	-	-	-	-	-	-	-	1	-	-	20		1	
M	84	-	2	14	-	-	-	-	-	-	-	16	-	-	533	23 21	16	
	90	8	1	-	-	-	-	-	-	-	-	9	-	-	300	21 28	9	
	96	-	8	4	-	-	-	-	-	-	-	12	-	-	240	25 59	12	
D	84	-	-	12	-	-	-	-	-	-	-	12	-	-	400		12	
	90	9	4	-	1	-	-	-	-	-	-	13	-	-	466		14	
	96	-	1	1	-	-	-	-	-	-	-	2	-	-	40		2	
X	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	60		3	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'84		07%			93%			00%			-14%							
'90		21%			00%			04%			-62%							
'96		60%			33%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'84	933	Dec:	43%			
												'90	799		58%			
												'96	300		13%			